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Zero-Budget Natural Farming

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ARTICLE ID: 59

Abstract

Chemical fertilizers and insecticides have increased at an alarming rate in India since the green revolution. Excessive chemical use has a negative influence on the ecosystem, soil, human health, and Consumption of groundwater purity. To limit the usage of artificial fertilizers and pesticides in this situation, the Zero Budget Natural Farming technique was implemented. Agriculture is a significant industry in India. The continued use of pesticides and chemicals poses a major threat to the health of Indian farmers. Zero-budget farming has the potential to significantly reduce production expenses. Mulching, soil protection measures, natural insecticides, and fertilizers are used by low-budget farmers. Jivamrita, Bijamrita, Acchadana (Mulching), and Whapasa are the four main pillars of natural farming on a low budget. Mulching, soil conservation measures, natural insecticides, and fertilizers are used by farmers on a low budget. The continual retention of crop wastes replenishes soil fertility and aids in soil health maintenance. Pest and disease management is an important part of zero-budget natural farming crop production methods. In this report, we have discussed about the concept, need, benefits, major pillars, principles of ZBNF, opportunities and challenges of adopting ZBNF and the factors to scale up zero budget natural farming.

Keywords: Ecosystem; food security; mulching; sustainable agriculture

Introduction

Agricultural intensification, characterized by increasing physical, managerial, and capital inputs resulting in increased production or output, has been a common strategy for many decades, in both industrialized and developing countries. The success of this strategy at the farm level (including household income) and the country level (meeting food security goals) has been uneven, and increased yield is generally prioritized over other outcomes. In

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countries like India, which are still dominated by smallholder farms, there are many obstacles to an intensification approach, such as constraints on the ability to purchase inputs and the difficulty in applying this approach at smaller scales.

In India and elsewhere, there are numerous approaches that are counter to conventional forms of agricultural intensification, including agro ecological principles, sustainable and organic agriculture, and permaculture. All of these generally take into account both the physical and social aspects of agriculture and the broader food system, and at least to some degree utilize or modify traditional practices appropriate to the country or region. Optimization and the recognition of trade-offs (implicit or explicit) across and within these domains are hallmarks of the assessment of sustainability of food system function and outcome. There are numerous conceptual frameworks that illustrate the need to assess outcomes across domains (e.g., TEEB 2018; Webb *et al.* 2020). There are far fewer frameworks that either propose or use specific metrics and indicators. An example of the latter is Gustafson *et al.* (2016), which proposed specific, country-level metrics. Subsequently, Chaudhary *et al.* (2018) applied this assessment framework, using from two to six indicators with seven metrics (food nutrient adequacy, ecosystem stability, affordability and availability, sociocultural wellbeing, resilience, food safety, and waste and loss reduction). These frameworks can be used to examine the impacts of emerging agroecological approaches on sustainability domains and interactions between domains.

Zero Budget Natural Farming was developed by Subhash Palekar in the mid-1990s in Maharashtra (Biswas 2020). The practice originally consisted of four core elements:

1. *jeevamrutham*, a soil inoculant made of cow dung, urine, pulse flour, jaggery, and soil;
2. *beejamrutham*, a seed coating made of similar ingredients;
3. *acchadana*, mulching; and
4. *whapasa*, soil aeration, as an outcome of the other three principles. These practices address a broad range of goals, including stimulating microbial activity, increasing soil carbon, adding nitrogen through green mulching, and accelerating the availability of existing nitrogen in the topsoil. ZBNF, as defined by the Government of Andhra Pradesh, has evolved from Palekar's teachings to include regenerative practices such as continuous groundcover and the five-layer model, which is a specific type of

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intercropping. Key features of ZBNF that are consistent with its founding are the use of natural inputs and, where available, the use of indigenous seed.

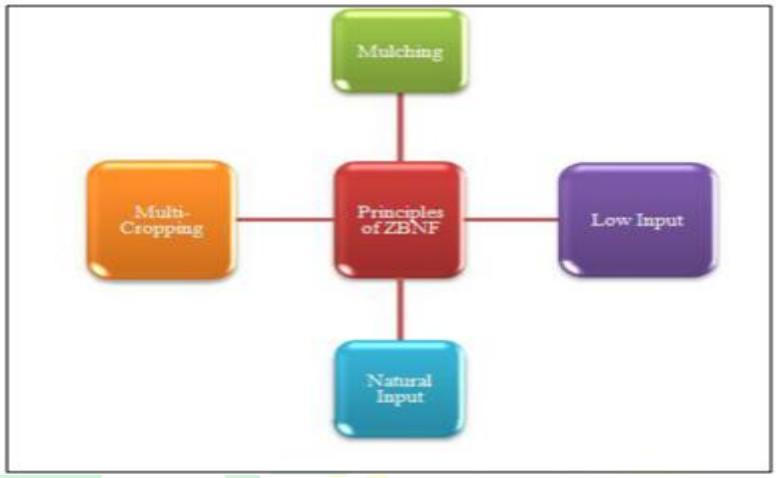

Fig.1 Four pillars of ZBNF

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ZBNF was also highlighted in budget 2019 in the bid to double farmer's income by 2022. However, scientists from the National Academy of Agricultural Sciences suggested that there is no need for the government to promote ZBNF unless there is proper scientific validation.

ero budget natural farming is a method of chemical-free agriculture drawing from traditional Indian practices. It was originally promoted by agriculturist Subhash Palekar, who developed it in the mid-1990s as an alternative to the Green Revolution's methods that are driven by chemical fertilizers and pesticides and intensive irrigation. It is a unique model that relies on Agro-ecology. It aims to bring down the cost of production to nearly zero and return to a pre-green evolution style of farming. It claims that there is no need for expensive inputs such as fertilisers, pesticides and intensive irrigation.

ZBNF is based on 4 pillars:

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- **Jeevamrutha:** It is a mixture of fresh cow dung and aged cow urine (both from India's indigenous cow breed), jaggery, pulse flour, water and soil; to be applied on farmland.
- **Bijamrita:** It is a concoction of neem leaves & pulp, tobacco and green chilies prepared for insect and pest management that can be used to treat seeds.
- **Acchadana (Mulching)**: It protects topsoil during cultivation and does not destroy it by tilling.
- **Whapasa**: It is the condition where there are both air molecules and water molecules present in the soil. Thereby helping in reducing irrigation requirement.

Benefits of ZBNF

With the rising cost of external inputs (fertilizers and pesticides), which is the leading cause of indebtedness and suicide among farmers. According to the National Sample Survey Office (NSSO) data, almost 70% of agricultural households spend more than they earn and more than half of all farmers are in debt. Since in ZBNF there is the need to spend money or take loans for external inputs, the cost of Production could be reduced and farming made into a "zero budget" exercise. This would break the debt cycle for many small farmers and help to envisage the doubling of farmer's income by 2022. At a time when chemical-intensive farming is resulting in soil and environmental degradation, a zero-cost environmentally-friendly farming method is definitely a timely initiative. The ZBNF method promotes soil aeration, minimal watering, intercropping, bunds and topsoil mulching and discourages intensive irrigation and deep ploughing. It suits all crops in all agro-climatic zones.

Citing the benefits of ZBNF, in June 2018, Andhra Pradesh rolled out an ambitious plan to become India's first State to practise 100% natural farming by 2024.

Issues Related To ZBNF

Sikkim (India's first organic state), has seen some decline in yields following conversion to organic farming. Many farmers have reverted to conventional farming after seeing their ZBNF returns drop after a few years. While ZBNF has definitely helped preserve soil fertility, its role in boosting productivity and farmers' income isn't conclusive yet. ZBNF advocates the need of an Indian breed cow, whose numbers are declining at a fast pace. According to Livestock Census, the country's total population of indigenous and nondescript cattle has dropped by 8.1%. Low expenditure by the government: Last year, the government

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launched Rashtriya Krishi Vikas Yojana, a flagship Green Revolution scheme with an allocation of Rs 3,745 crore for the financial year 2019-20. Whereas the Paramparagat Krishi Vikas Yojana, which was meant to promote organic farming and soil health has been allocated Rs 325 crore only.

Benefits

A study – "Life Cycle Assessment of ZBNF and Non-ZBNF in Andhra Pradesh" - reports the following benefits:

- ZBNF processes require 50–60 per cent less water and less electricity (than non-ZBNF) for all the selected crops.
- ZBNF reduces methane emissions significantly through multiple aeration. It also has the potential to avoid residue burning by practicing mulching.
- The cost of cultivation is lower in ZBNF.

Some of the states following ZBNF

Karnataka has initiated implementation of ZBNF on pilot basis in an area of 2000 ha in each of the10 Agro Climatic Zones of the State through the respective State Agriculture/ horticulture Universities as demonstrations/ scientific experimental trials in farmer's fields and in the research stations of the concerned universities.

Himachal Pradesh is implementing State-funded scheme 'Prakritik Kheti Khusha Kisan' since May,2018, the details of which are as:

2018-19: 2669 farmers; Area - 357 ha.

2019-20: 19936 farmers; Area - 1155 ha.

The findings of studies conducted by the state indicated that ZBNF practice showed an improvement in soil quality within a single cropping season and incidence of invasive leaf miner was significantly less in ZBNF system as compared to the organic farming and conventional farming.

Kerala –Awareness programmes, trainings and workshops are being conducted to draw interest of farmers towards ZBNF.

Union Government is promoting and supporting organic farming and Zero Budget Natural Farming under various schemes

DARE/ICAR through its Plan Scheme 'Network Project on Organic Farming (NPOF)' is undertaking research in 20 centres covering 16 states to develop location-specific

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organic farming package of practices for crops and cropping systems. Organic farming package of practices for 51crops/cropping systems have been developed to provide technical backstopping to the line departments' schemes implemented in the country. PKVY, a sub-component of Soil Health Management (SHM) scheme under National Mission for Sustainable Agriculture (NMSA), promotes cluster-based organic farming with Participatory Guarantee System (PGS) certification. Cluster formation, training, certification and marketing are supported under the scheme.

Way Forward

NITI Aayog is one of the foremost promoters of ZBNF method. The Andhra Pradesh Government experience is also being monitored closely to judge the need for further public funding support for ZBNF. The Indian Council of Agricultural Research is also studying the ZBNF method practiced by basmati and wheat farmers in some parts of India, evaluating the impact on productivity, economics and soil health including soil organic carbon and soil fertility.

References

1. https://www.pib.gov.in/PressReleseDetail.aspx?PMO=3&PRID=1782250
2. https://www.pib.gov.in/PressReleseDetail.aspx?PMO=3&PRID=1782166
3. https://sbi.co.in/documents/2182813/4777159/zero+budget+natural+farming+kisan+world.pdf
4. https://vikaspedia.in/agriculture/best-practices/sustainable-agriculture/climate-martagriculture/
5. zero-budget-natural-farming-in-andhra-pradesh
6. https://pib.gov.in/PressReleasePage.aspx?PRID=1592265
7. https://pib.gov.in/PressReleseDetail.aspx?PRID=1593123
8. https://www.unep.org/news-and-stories/press-release/andhra-pradesh-become-indias-first-zerobudget-natural-farming-state
9. https://pib.gov.in/PressReleasePage.aspx?PRID=1739600
10. https://www.pib.gov.in/PressReleasePage.aspx?PRID=1773162